

FORM-PTO-1390  
(Rev. 10-96)

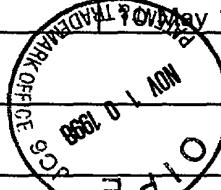
U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

022650-498

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)

09/180477

INTERNATIONAL APPLICATION NO.  
PCT/FR97/00816INTERNATIONAL FILING DATE  
07 May 1997PRIORITY DATE CLAIMED  
10 May 1996TITLE OF INVENTION  
PROTECTION AGAINST TERMITESAPPLICANT(S) FOR DO/EO/US  
Xavier MARZE

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1.  This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2.  This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3.  This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and the PCT Articles 22 and 39(1).
4.  A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5.  A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a.  is transmitted herewith (required only if not transmitted by the International Bureau), including Request.
  - b.  has been transmitted by the International Bureau.
  - c.  is not required, as the application was filed in the United States Receiving Office (RO/US)
6.  A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7.  Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a.  are transmitted herewith (required only if not transmitted by the International Bureau).
  - b.  have been transmitted by the International Bureau.
  - c.  have not been made; however, the time limit for making such amendments has NOT expired.
  - d.  have not been made and will not be made.
8.  A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9.  An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10.  A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

## Items 11. to 16. below concern other document(s) or information included:

11.  An Information Disclosure Statement under 37 CFR 1.97 and 1.98, Form PTO-1449, associated Transmittal Letter and copies of the 17 cited documents.
12.  An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13.  A **FIRST** preliminary amendment.  
 A **SECOND** or **SUBSEQUENT** preliminary amendment.
14.  A substitute specification.
15.  A change of power of attorney and/or address letter.
16.  Other items or information:

A separate Claim for Convention Priority and copy of Form PCT/IB/304.

A copy of the International Search Report (in French and English).

A copy of the International Preliminary Examination Report (Form PCT/IPEA/409) (in French only).

A copy of Form PCT/IB/308.

The declaration of the inventor will follow.

17.  The following fees are submitted:

CALCULATIONS

PTO USE ONLY

**Basic National Fee (37 CFR 1.492(a)(1)-(5)):**

Search Report has been prepared by the EPO or JPO ..... \$930

International preliminary examination fee paid to USPTO (37 CFR 1.482) ..... \$720.00

No international preliminary examination fee paid to USPTO (37 CFR 1.482)  
but international search fee paid to USPTO (37 CFR 1.445(a)(2)) ..... \$790.00Neither international preliminary examination fee (37 CFR 1.482) nor  
international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$1070.00International preliminary examination fee paid to USPTO (37 CFR 1.482)  
and all claims satisfied provisions of PCT Article 33(2)-(4) ..... \$98.00**ENTER APPROPRIATE BASIC FEE AMOUNT =****\$ 930.00**Surcharge of \$130.00 for furnishing the oath or declaration later than  
months from the earliest claimed priority date (37 CFR 1.492(e)). 20  30**\$ 130.00**

Claims *	Number Filed *	Number Extra *	Rate	
Total Claims	71 -20 =	51	X\$22.00	\$ 1,122.00
Independent Claims	1 -3 =	0	X\$82.00	\$ 0.00
Multiple dependent claim(s) (if applicable)			+\$270.00	\$ 0.00
			<b>TOTAL OF ABOVE CALCULATIONS =</b>	<b>\$ 2,182.00</b>
			Reduction for 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).	\$ 0.00
			<b>SUBTOTAL =</b>	<b>\$ 2,182.00</b>
			Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492(f)).	\$ 0.00
			<b>TOTAL NATIONAL FEE =</b>	<b>\$ 2,182.00</b>
			Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +	\$ 0.00
			<b>TOTAL FEES ENCLOSED =</b>	<b>\$ 2,182.00</b>
			<b>Amount to be: refunded</b>	\$
			<b>charged</b>	\$

a.  A check in the amount of \$ 2,182.00 to cover the above fees is enclosed.

b.  Please charge my Deposit Account No. 02-4800 in the amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed.

c.  The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-4800. A duplicate copy of this sheet is enclosed.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO:

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Mary Katherine Baumeister  
NAME

26,254

REGISTRATION NUMBER

Dated: November 10, 1998

09/180477  
405 Rec'd PCT/PTO 10 NOV 1998

Patent Application  
Attorney's Docket No. 022650-498

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
UNITED STATES ELECTED OFFICE (EO/US)  
UNDER THE PATENT COOPERATION TREATY

In re Patent Application of ) ATTENTION: BOX PCT  
Xavier MARZE )  
International Application No.: PCT/FR97/00816 ) Group Art Unit:  
International Filing Date: May 7, 1997 )  
Date of Entry into U.S. National Phase: ) Examiner:  
November 10, 1998 )  
U.S. Application No. )  
For: PROTECTION AGAINST )  
TERMITES )

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
**BOX PCT**  
Washington, D.C. 20231

Sir:

Prior to examination on the merits, please amend the accompanying 35 U.S.C. §371 application as follows:

**IN THE ABSTRACT OF THE DISCLOSURE:**

Please add the abstract presented on the accompanying page 14.

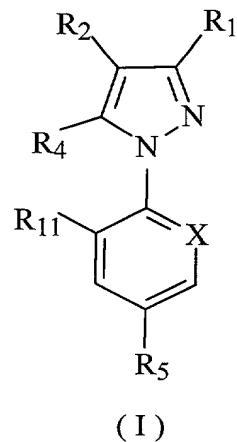
**IN THE CLAIMS:**

Page 10, line 1, please change "CLAIMS" to --WHAT IS CLAIMED IS:--.

Please cancel Claims 1-11, without prejudice or disclaimer.

Kindly add the following new Claims 12-82:

--12. A composite material comprising a gypsum board covered on at least one of its two faces with a sheet made of cardboard or paper, wherein the sheet, or each of the sheets, comprises an insecticidally effective amount of a compound having the formula:



wherein:

R<sub>1</sub> is halogen, CN or methyl;

R<sub>2</sub> is S(O)<sub>n</sub>R<sub>3</sub>;

R<sub>3</sub> is alkyl or haloalkyl;

R<sub>4</sub> is hydrogen, halogen, NR<sub>5</sub>R<sub>6</sub>, S(O)<sub>m</sub>R<sub>7</sub>, C(O)R<sub>7</sub>, C(O)O-R<sub>7</sub>, alkyl, haloalkyl, OR<sub>8</sub> or -N=C(R<sub>9</sub>)(R<sub>10</sub>);

$R_5$  and  $R_6$  independently are hydrogen, alkyl, haloalkyl,  $C(O)alkyl$  or  $S(O)_rCF_3$ , or  $R_5$  and  $R_6$  together form a divalent alkylene radical which is uninterrupted or interrupted by one or two divalent heteroatoms selected from the group consisting of oxygen and sulphur;

$R_7$  is alkyl or haloalkyl;

$R_8$  is alkyl, haloalkyl or hydrogen;

$R_9$  is alkyl or hydrogen;

$R_{10}$  is phenyl or heteroaryl which is unsubstituted or is substituted by one or more halogen, OH, -O-alkyl, -S-alkyl, cyano or alkyl;

$X$  is a trivalent nitrogen atom or a  $C-R_{12}$  radical, the other three valencies of the carbon atom forming part of the aromatic ring;

$R_{11}$  and  $R_{12}$  are, independently of each other, hydrogen or halogen;

$R_{13}$  is halogen, haloalkyl, haloalkoxy,  $S(O)_qCF_3$  or  $SF_5$ ;

$m$ ,  $n$ ,  $q$  and  $r$  are, independently of one another, an integer equal to 0, 1 or 2;

with the proviso that, when  $R_1$  is methyl, then  $R_3$  is haloalkyl,  $R_4$  is  $NH_2$ ,  $R_{11}$  is Cl,  $R_{13}$  is  $CF_3$  and  $X$  is N.

--13. A composite material according to Claim 12, wherein the gypsum board is covered on both of its faces with a sheet of cardboard or paper, at least one of these sheets comprising an insecticidally effective amount of a compound of formula (I).

--14. A composite material according to Claim 12, wherein the gypsum board is covered on both of its faces with a sheet of cardboard or paper, each of these sheets comprising an insecticidally effective amount of a compound of formula (I).

--15. A composite material according to Claim 12, wherein the compound of formula (I) has at least one feature selected from the group consisting of:

- (a)  $R_1$  is CN;
- (b)  $R_3$  is haloalkyl;
- (c)  $R_4$  is  $NH_2$ ;
- (d)  $R_{11}$  and  $R_{12}$  are, independently of each other, halogen; and
- (e)  $R_{13}$  is haloalkyl.

--16. A composite material according to Claim 13, wherein the compound of formula (I) has at least one feature selected from the group consisting of:

- (a)  $R_1$  is CN;
- (b)  $R_3$  is haloalkyl;
- (c)  $R_4$  is  $NH_2$ ;
- (d)  $R_{11}$  and  $R_{12}$  are, independently of each other, halogen; and
- (e)  $R_{13}$  is haloalkyl.

--17. A composite material according to Claim 14, wherein the compound of formula (I) has at least one feature selected from the group consisting of:

- (a)  $R_1$  is CN;
- (b)  $R_3$  is haloalkyl;
- (c)  $R_4$  is  $NH_2$ ;
- (d)  $R_{11}$  and  $R_{12}$  are, independently of each other, halogen; and
- (e)  $R_{13}$  is haloalkyl.

--18. A composite material according to Claim 15, wherein the compound of formula (I) is 5-amino-3-cyano-1-(2,6-dichloro-4-trifluoromethylphenyl)-4-trifluoromethylsulfinylpyrazole.

--19. A composite material according to Claim 16, wherein the compound of formula (I) is 5-amino-3-cyano-1-(2,6-dichloro-4-trifluoromethylphenyl)-4-trifluoromethylsulfinylpyrazole.

--20. A composite material according to Claim 17, wherein the compound of formula (I) is 5-amino-3-cyano-1-(2,6-dichloro-4-trifluoromethylphenyl)-4-trifluoromethylsulfinylpyrazole.

--21. A composite material according to Claim 12, wherein the gypsum board has a thickness of between 0.5 and 5 cm, and the cardboard or paper has a relative density of between 50 and 500 g/m<sup>2</sup>.

--22. A composite material according to Claim 13, wherein the gypsum board has a thickness of between 0.5 and 5 cm, and the cardboard or paper has a relative density of between 50 and 500 g/m<sup>2</sup>.

--23. A composite material according to Claim 14, wherein the gypsum board has a thickness of between 0.5 and 5 cm, and the cardboard or paper has a relative density of between 50 and 500g/m<sup>2</sup>.

--24. A composite material according to Claim 18, wherein the gypsum board has a thickness of between 0.5 and 5 cm, and cardboard or paper has a relative density of between 50 and 500 g/m<sup>2</sup>.

--25. A composite material according to Claim 19, wherein the gypsum board has a thickness of between 0.5 and 5 cm, and the cardboard or paper has a relative density of between 50 and 500 g/m<sup>2</sup>.

--26. A composite material according to Claim 20, wherein the gypsum board has a thickness of between 0.5 and 5 cm, and the cardboard or paper has a relative density of between 50 and 500 g/m<sup>2</sup>.

--27. A composite material according to Claim 21, wherein the gypsum board has a thickness of between 0.6 and 2 cm, and the cardboard or paper has a relative density of between 150 and 250 g/m<sup>2</sup>.

--28. A composite material according to Claim 22, wherein the gypsum board has a thickness of between 0.6 and 2 cm, and the cardboard or paper has a relative density of between 150 and 250 g/m<sup>2</sup>.

--29. A composite material according to Claim 23, wherein the gypsum board has a thickness of between 0.6 and 2 cm, and the cardboard or paper has a relative density of between 150 and 250 g/m<sup>2</sup>.

--30. A composite material according to Claim 24, wherein the gypsum board has a thickness of between 0.6 and 2 cm, and the cardboard or paper has a relative density of between 150 and 250 g/m<sup>2</sup>.

--31. A composite material according to Claim 25, wherein the gypsum board has a thickness of between 0.6 and 2 cm, and the cardboard or paper has a relative density of between 150 and 250 g/cm<sup>2</sup>.

--32. A composite material according to Claim 26, wherein the gypsum board has a thickness of between 0.6 and 2 cm, and the cardboard or paper has a relative density of between 150 and 250 g/cm<sup>2</sup>.

--33. A composite material according to Claim 12, wherein the thickness of the cardboard or paper sheet or sheets is between 0.1 and 10 mm.

--34. A composite material according to Claim 13, wherein the thickness of the cardboard or paper sheet or sheets is between 0.1 and 10 mm.

--35. A composite material according to Claim 14, wherein the thickness of the cardboard or paper sheet or sheets is between 0.1 and 10 mm.

--36. A composite material according to Claim 18, wherein the thickness of the cardboard or paper sheet or sheets is between 0.1 and 10 mm.

--37. A composite material according to Claim 19, wherein the thickness of the cardboard or paper sheet or sheets is between 0.1 and 10 mm.

--38. A composite material according to Claim 20, wherein the thickness of the cardboard or paper sheet or sheets is between 0.1 and 10 mm.

--39. A composite material according to Claim 24, wherein the thickness of the cardboard or paper sheet or sheets is between 0.1 and 10 mm.

--40. A composite material according to Claim 27, wherein the thickness of the cardboard or paper sheet or sheets is between 0.1 and 10 mm.

--41. A composite material according to Claim 30, wherein the thickness of the cardboard or paper sheet or sheets is between 0.1 and 10 mm.

--42. A composite material according to Claim 33, wherein the thickness of the cardboard or paper sheet or sheets is between 0.2 and 5 mm.

--43. A composite material according to Claim 34, wherein the thickness of the cardboard or paper sheet or sheets is between 0.2 and 5 mm.

--44. A composite material according to Claim 35, wherein the thickness of the cardboard or paper sheet or sheets is between 0.2 and 5 mm.

--45. A composite material according to Claim 36, wherein the thickness of the cardboard or paper sheet or sheets is between 0.2 and 5 mm.

--46. A composite material according to Claim 37, wherein the thickness of the cardboard or paper sheet or sheets is between 0.2 and 5 mm.

--47. A composite material according to Claim 38, wherein the thickness of the cardboard or paper sheet or sheets is between 0.2 and 5 mm.

--48. A composite material according to Claim 39, wherein the thickness of the cardboard or paper sheet or sheets is between 0.2 and 5 mm.

--49. A composite material according to Claim 40, wherein the thickness of the cardboard or paper sheet or sheets is between 0.2 and 5 mm.

--50. A composite material according to Claim 41, wherein the thickness of the cardboard or paper sheet or sheets is between 0.2 and 5 mm.

--51. A composite material according to Claim 12, wherein the insecticidally effective amount of compound of formula (I) is an amount sufficient to prevent perforations by insects.

--52. A composite material according to Claim 18, wherein the insecticidally effective amount of compound of formula (I) is an amount sufficient to prevent perforations by insects.

--53. A composite material according to Claim 12, wherein the insecticidally effective amount of compound of formula (I) is a termiticidally effective amount.

--54. A composite material according to Claim 13, wherein the insecticidally effective amount of compound of formula (I) is a termiticidally effective amount.

--55. A composite material according to Claim 14, wherein the insecticidally effective amount of compound of formula (I) is a termiticidally effective amount.

--56. A composite material according to Claim 18, wherein the insecticidally effective amount of compound of formula (I) is a termiticidally effective amount.

--57. A composite material according to Claim 19, wherein the insecticidally effective amount of compound of formula (I) is a termiticidally effective amount.

--58. A composite material according to Claim 20, wherein the insecticidally effective amount of compound of formula (I) is a termiticidally effective amount.

--59. A composite material according to Claim 12, wherein the insecticidally effective amount of compound of formula (I) is between 0.001 and 10 g/m<sup>2</sup>.

--60. A composite material according to Claim 13, wherein the insecticidally effective amount of compound of formula (I) is between 0.001 and 10 g/m<sup>2</sup>.

--61. A composite material according to Claim 14, wherein the insecticidally effective amount of compound of formula (I) is between 0.001 and 10 g/m<sup>2</sup>.

--62. A composite material according to Claim 18, wherein the insecticidally effective amount of compound of formula (I) is between 0.001 and 10 g/m<sup>2</sup>.

--63. A composite material according to Claim 19, wherein the insecticidally effective amount of compound of formula (I) is between 0.001 and 10 g/m<sup>2</sup>.

--64. A composite material according to Claim 20, wherein the insecticidally effective amount of compound of formula (I) is between 0.001 and 10 g/m<sup>2</sup>.

--65. A composite material according to Claim 59, wherein the insecticidally effective amount of compound of formula (I) is between 0.01 and 2 g/m<sup>2</sup>.

--66. A composite material according to Claim 60, wherein the insecticidally effective amount of compound of formula (I) is between 0.01 and 2 g/m<sup>2</sup>.

--67. A composite material according to Claim 61, wherein the insecticidally effective amount of compound of formula (I) is between 0.01 and 2 g/m<sup>2</sup>.

--68. A composite material according to Claim 62, wherein the insecticidally effective amount of compound of formula (I) is between 0.01 and 2 g/m<sup>2</sup>.

--69. A composite material according to Claim 63, wherein the insecticidally effective amount of compound of formula (I) is between 0.01 and 2 g/m<sup>2</sup>.

--70. A composite material according to Claim 64, wherein the insecticidally effective amount of compound of formula (I) is between 0.01 and 2 g/m<sup>2</sup>.

--71. A method for protecting a dwelling against damage caused by perforating insects, said method comprising fixing a composite material as claimed in Claim 12 to at least 50% of the total surface area of the interior wall of partitions and walls.

--72. A method for protecting a dwelling against damage caused by perforating insects, said method comprising fixing a composite material as claimed in Claim 18 to at least 50% of the total surface area of the interior wall of partitions and walls.

--73. A method according to Claim 71, wherein the composite material is fixed to at least 95% of the total surface area of the interior wall of partitions and walls.

--74. A method according to Claim 72, wherein the composite material is fixed to at least 95% of the total surface area of the interior wall of partitions and walls.

--75. A method for protecting a dwelling against damage caused by termites, said method comprising fixing a composite material as claimed in Claim 53 to at least 50% of the total surface area of the interior wall of partitions and walls.

--76. A method for protecting a dwelling against damage caused by termites, said method comprising fixing a composite material as claimed in Claim 56 to at least 50% of the total surface area of the interior wall of partitions and walls.

--77. A method according to Claim 75, wherein the composite material is fixed to at least 95% of the total surface area of the interior wall of partitions and walls.

--78. A method according to Claim 76, wherein the composite material is fixed to at least 95% of the total surface area of the interior wall of partitions and walls.

--79. A dwelling having improved protection against damage caused by perforating insects, wherein at least 50% of the total surface area of the interior wall of its partitions and walls is covered with a composite material as claimed in Claim 12.

--80. A dwelling having improved protection against damage caused by perforating insects, wherein at least 50% of the total surface area of the interior wall of its partitions and walls is covered with a composite material as claimed in Claim 18.

--81. A dwelling according to Claim 79, wherein the composite material covers at least 95% of the total surface area of the interior wall of partitions and walls.

--82. A dwelling according to Claim 80, wherein the composite material covers at least 95% of the total surface area of the interior wall of partitions and walls--.

**REMARKS**

The foregoing amendment replaces original Claims 1-11 with new Claims 12-82.

The new claims are of the same generic scope as the original claims, but have been written in conformity with U.S. law and practice. In particular, multiple dependent claims, language such as "characterized in that", "can", "can be", "such as", "and/or", "preferably" and "in particular", and improper chemical nomenclature have been eliminated. The new claims now separately claim combinations previously claimed in multiple dependent claims or claims containing "preferably" language. Rewriting the claims has thus resulted in a larger total number of claims, but improper multiple dependent claims and other improper language have been eliminated. No new matter has been added. New Claim 12 replaces original Claim 1. New Claims 13 and 14 replace original Claim 2. New Claims 15-17 replace original Claim 3. New Claims 18-20 replace original Claim 4. New Claims 21-32 replace original Claim 5. New Claims 33-50 replace original Claim 6. New Claims 51-58 replace original Claim 7. New Claims 59-70 replace original Claim 8. New Claims 71-74 replace original Claim 9. New Claims 75-78 replace original Claim 10. New Claims 79-82 replace original Claim 11.

Xavier MARZE

Attorney's Docket No. 022650-498

In view of this amendment and the accompanying Information Disclosure Statement, an early Action on the merits is believed to be in order and is earnestly solicited.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

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Date: November 10, 1998

## ABSTRACT OF THE DISCLOSURE

A composite material comprising a gypsum partitional slab coated on at least one of its two surfaces with a cardboard or paper ply, wherein said ply is impregnated with an insecticidally effective amount of a 1-phenylpyrazole type insecticide. The insecticide is preferably 5-amino-3-cyano-1-(2,6-dichloro-4-trifluoromethylphenyl)-4-trifluoromethylsulfinylpyrazole. The composite material provides a method for protecting dwellings against damage caused by borers, especially termites, wherein the composite material is fixed on at least 50%, preferably 95%, of the total surface area of the internal face of partitions and walls.

1900-1901. *Journal of the Royal Society of Medicine*, London, Vol. 14, No. 1, pp. 1-10.

## Protection against termites

The present invention relates to the field of gypsum-based composite construction materials and more specifically to gypsum blocks, also known under the 5 name of plasterboard. Another subject of the invention is a method for the protection of dwellings against damage caused by insects of perforating type, and also the dwellings thus protected.

Gypsum blocks are widely known and used in 10 the construction and fitting out of residential buildings. Within the meaning of the present invention, gypsum blocks is understood to mean a composite material comprising a gypsum board covered on at least one of its faces, preferably on both, with a sheet of 15 cardboard or paper. Gypsum blocks are usually fixed to the crude material used for the construction of partitions and walls and more specifically to the wall of the said material situated inside the dwellings, whatever the material from which these partitions or 20 walls are constructed: concrete, bricks or other. The surface condition of these blocks makes possible rapid finishing of the partition or wall thus obtained, in particular as regards the application of a coating and/or of paint and/or of wallpaper.

25 Moreover, it is known that these gypsum blocks are particularly liable to be attacked by insects, in particular by insects of perforating type

and more particularly by termites. In point of fact, damage caused to dwellings by these insects, and particularly by termites, can be quite considerable. Indeed, termites in particular are capable of moving 5 inside the construction materials of dwellings and of rendering them brittle, due to the fact that they feed thereon. This damage can become more serious as the termites accomplish their work of destruction without being detected, until the said work finally ends in 10 causing irreparable damage to the dwelling. Moreover, as mentioned above, termites move in parts of dwellings which are virtually impossible to access, making direct treatment of the said termites virtually impossible.

Wooden parts of buildings, such as frameworks 15 or panelling, in particular window frames and door frames, are more especially exposed to damage caused by these insects.

There thus exists a need to have available gypsum blocks which are protected against insects, in 20 particular termites.

Another aim of the invention is to provide gypsum blocks which are resistant to insects, in particular to termites.

Another aim of the invention is to provide 25 gypsum blocks which prevent termites from moving along in tunnels which they hollow out inside construction components.

Another aim of the invention is to provide

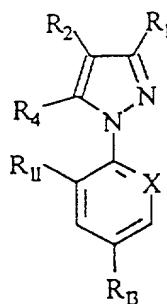
gypsum blocks comprising a small amount of insecticidal compound.

Another aim of the invention is to meet the existing requirements as regards the protection of 5 dwellings against damage caused by termites.

Another aim of the invention is to provide dwellings protected against termites.

It has now been found that these aims could be achieved in all or in part by virtue of the 10 composite material according to the invention.

The invention consequently relates to a composite material comprising a gypsum board covered on at least one of its 2 faces with a sheet made of cardboard or paper, characterized in that the sheet, or 15 each of the sheets, comprises, as insecticidal active material, a 1-arylpyrazole, of formula (I):



(I)

in which:

R<sub>1</sub> is a halogen atom or a CN or methyl group;

R<sub>2</sub> is S(O)<sub>n</sub>R<sub>3</sub>;

20 R<sub>3</sub> is alkyl or haloalkyl;

$R_4$  represents a hydrogen or halogen atom or an  $NR_5R_6$ ,  $S(O)_mR_7$ ,  $C(O)R_8$  or  $C(O)O-R_9$ , alkyl, haloalkyl or  $OR_8$  radical or an  $-N=C(R_9)(R_{10})$  radical;

5  $R_5$  and  $R_6$  independently represent a hydrogen atom or an alkyl, haloalkyl,  $C(O)alkyl$  or  $S(O)_rCF_3$  radical or  $R_5$  and  $R_6$  can together form a divalent alkylene radical which can be interrupted by one or two divalent heteroatoms, such as oxygen or sulphur;

10  $R_7$  represents an alkyl or haloalkyl radical;

$R_8$  represents an alkyl or haloalkyl radical or a hydrogen atom;

$R_9$  represents an alkyl radical or a hydrogen atom;

15  $R_{10}$  represents a phenyl or heteroaryl group optionally substituted by one or a number of halogen atoms or groups such as OH, -O-alkyl, -S-alkyl, cyano or alkyl;

20  $X$  represents a trivalent nitrogen atom or a  $C-R_{12}$  radical, the other three valencies of the carbon atom forming part of the aromatic ring;

$R_{11}$  and  $R_{12}$  represent, independently of one another, a hydrogen or halogen atom;

$R_{13}$  represents a halogen atom or a haloalkyl, haloalkoxy,  $S(O)_qCF_3$  or  $SF_5$  group;

25  $m$ ,  $n$ ,  $q$  and  $r$  represent, independently of one another, an integer equal to 0, 1 or 2;

with the proviso that, when  $R_1$  is methyl, then  $R_3$  is haloalkyl,  $R_4$  is  $NH_2$ ,  $R_{11}$  is  $Cl$ ,  $R_{13}$  is  $CF_3$  and

X is N.

In the present text, it is clearly understood that the alkyl radicals of the definition of the formula (I) are, except when otherwise defined,

5 radicals with a straight or branched chain generally comprising from 1 to 6 carbon atoms. The ring formed by the divalent alkylene radical representing R<sub>5</sub> and R<sub>6</sub> and by the nitrogen atom to which R<sub>5</sub> and R<sub>6</sub> are attached is generally a 5-, 6- or 7-membered ring.

10 A preferred class of compounds of formula (I) is composed of the compounds such that R<sub>1</sub> is CN and/or R<sub>3</sub> is haloalkyl and/or R<sub>4</sub> is NH<sub>2</sub> and/or R<sub>11</sub> and R<sub>12</sub> are, independently of one another, a halogen atom and/or R<sub>13</sub> is haloalkyl.

15 A compound of formula (I) which is very particularly preferred in the invention is

1-[2,6-Cl<sub>2</sub>-4-CF<sub>3</sub>phenyl]-3-CN-4-[SO-CF<sub>3</sub>]-5-NH<sub>2</sub>pyrazole,  
hereinafter known as compound A.

20 According to a preferred alternative form of the invention, the gypsum board is covered on both its faces with a sheet of cardboard or paper, at least one of these sheets, preferably both, comprising the insecticidal active material.

25 The gypsum board generally has a thickness of between 0.5 and 5 cm, preferably between 0.6 and 2 cm, and the cardboard or the paper used to cover one of its faces (or both) usually have a relative density of between 50 and 500 g/m<sup>2</sup>, preferably between 150 and

250 g/m<sup>2</sup>.

The thickness of the cardboard or paper sheet or sheets is generally between 0.1 and 10 mm, preferably between 0.2 and 5 mm.

5 The gypsum block according to the invention, although comprising an amount of the compound of formula (I) localized only in the thickness of the cardboard (or paper) sheet or sheets, advantageously and in its entirety offers improved protection against 10 termites, in particular as regards the number and the size of the perforations produced by the latter. This improved protection results in particular from the destruction of more than 70%, preferably of more than 95%, of the population of termites attacking the said 15 block.

The amount of compound of formula (I) in the gypsum blocks according to the invention is an amount which is effective against perforations by insects, in particular by termites.

20 These effective amounts are generally between 0.001 and 10 g/m<sup>2</sup>, preferably between 0.01 and 2 g/m<sup>2</sup>. The possibility of obtaining improved protection against termites by means of a small amount of active compound is particularly advantageous.

25 Compounds of formula (I) can be prepared according to one or other of the processes described in Patent Applications WO 87/3781, 93/6089 or 94/21606 or European Patent Application 295,117 or any other

process coming within the competence of the person skilled in the art who is a specialist in chemical synthesis.

The composite material according to the 5 invention can be prepared by at least one of the 2 following methods:

a) Liquid gypsum is poured, depending on the situation, onto 1 cardboard sheet or alternatively between 2 horizontal cardboard (or paper) sheets 10 progressing continuously over rollers and separated by a distance substantially equal to the thickness of the gypsum blocks. At least one of these sheets, preferably both, have been impregnated beforehand with a composition comprising the active material of formula 15 (I). The manufacture continues, in accordance with the known process, with a drying phase.

The composition used for the impregnation is generally a solution of the compound of formula (I) in a solvent, such as propylene glycol, or alternatively a 20 water-emulsifiable concentrate prepared in a known way.

This impregnation can be carried out, for example, by incorporation of the composition in the paper pulp used to manufacture the cardboard or alternatively by passing the cardboard sheet in the dry 25 state into a tank of liquid in which the said composition has been incorporated.

b) Gypsum blocks are manufactured according to a technique known per se. The composition comprising

the active material of formula (I) is applied by spraying over the paper or the cardboard covering the external surface or both external surfaces of the said blocks.

5 Another subject of the invention is a method for the protection of dwellings against damage caused by insects of perforating type, characterized in that a composite material according to the invention is fixed to at least 50%; preferably 95%, of the total surface 10 area of the interior wall of partitions and walls. Due to the effectiveness of the composite material according to the invention against insects of perforating type, in particular against termites, complete dwellings are thus better protected against 15 the attacks of these insects, and in particular the wooden parts which are more particularly exposed to these attacks, whatever their situation in the dwelling.

Termites are the most formidable among the 20 insects of perforating type capable of causing such damage.

A final subject of the invention is a dwelling offering improved protection against insects of perforating type, characterized in that at least 25 50%, preferably 95%, of the total surface area of the interior wall of its partitions and walls is covered with composite material according to the invention.

The following example, given without implied

limitation, illustrates the invention and shows how it can be put into practice.

**Example**

A gypsum block is used which has a surface 5 area of 30 cm<sup>2</sup> and a thickness of 0.8 cm and is covered on both its face with cardboard having a relative density of 195 g/m<sup>2</sup> and a thickness of 0.2 mm.

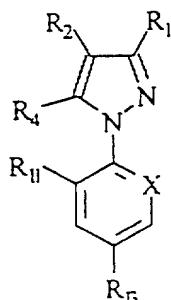
A solution of compound A in propylene glycol is sprayed over both faces of this block in an amount 10 such that the gypsum block contains 0.05 g/m<sup>2</sup> of compound A.

Two vertical cylindrical chambers with a diameter of 5 cm are separated using the gypsum block thus treated. The upper chamber comprises 160 termites 15 placed in damp compost. The lower chamber comprises a piece of wood placed in moistened sand.

After 21 days, a mortality rate equal to 100% is observed.

CLAIMS

1. Composite material comprising a gypsum board covered on at least one of its 2 faces with a sheet made of cardboard or paper, characterized in that 5 the sheet, or each of the sheets, comprises, as insecticidal active material, a 1-arylpyrazole, of formula (I):



(I)

in which:

R<sub>1</sub> is a halogen atom or a CN or methyl group;

10 R<sub>2</sub> is S(O)<sub>n</sub>R<sub>3</sub>;

R<sub>3</sub> is alkyl or haloalkyl;

R<sub>4</sub> represents a hydrogen or halogen atom or an NR<sub>5</sub>R<sub>6</sub>, S(O)<sub>m</sub>R<sub>7</sub>, C(O)R<sub>8</sub> or C(O)O-R<sub>9</sub>, alkyl, haloalkyl or OR<sub>8</sub> radical or an -N=C(R<sub>9</sub>)(R<sub>10</sub>) radical;

15 R<sub>5</sub> and R<sub>6</sub> independently represent a hydrogen atom or an alkyl, haloalkyl, C(O)alkyl or S(O)<sub>r</sub>CF<sub>3</sub> radical or R<sub>5</sub> and R<sub>6</sub> can together form a divalent alkylene radical which can be interrupted by one or two divalent heteroatoms, such as oxygen or sulphur;

20 R<sub>7</sub> represents an alkyl or haloalkyl radical;

R<sub>8</sub> represents an alkyl or haloalkyl radical or a hydrogen atom;

R<sub>9</sub> represents an alkyl radical or a hydrogen atom;

5 R<sub>10</sub> represents a phenyl or heteroaryl group optionally substituted by one or a number of halogen atoms or groups such as OH, -O-alkyl, -S-alkyl, cyano or alkyl;

10 X represents a trivalent nitrogen atom or a C-R<sub>12</sub> radical, the other three valencies of the carbon atom forming part of the aromatic ring;

R<sub>11</sub> and R<sub>12</sub> represent, independently of one another, a hydrogen or halogen atom;

15 R<sub>13</sub> represents a halogen atom or a haloalkyl, haloalkoxy, S(O)<sub>q</sub>CF<sub>3</sub> or SF<sub>5</sub> group;

m, n, q and r represent, independently of one another, an integer equal to 0, 1 or 2;

20 with the proviso that, when R<sub>1</sub> is methyl, then R<sub>3</sub> is haloalkyl, R<sub>4</sub> is NH<sub>2</sub>, R<sub>11</sub> is Cl, R<sub>13</sub> is CF<sub>3</sub> and X is N.

25 2. Composite material according to claim 1, characterized in that the gypsum board is covered on both its faces with a sheet of cardboard or paper, at least one of these sheets, preferably both, comprising the insecticidal active material.

3. Composite material according to one of claims 1 and 2, characterized in that, in the formula (I) of the insecticidal active material, R<sub>1</sub> is CN and/or

R<sub>3</sub> is haloalkyl and/or R<sub>4</sub> is NH<sub>2</sub> and/or R<sub>11</sub> and R<sub>12</sub> are, independently of one another, a halogen atom and/or R<sub>13</sub> is haloalkyl.

4. Composite material according to one of  
5 claims 1 to 3, characterized in that the insecticidal active material is 1-[2,6-Cl<sub>2</sub>-4-CF<sub>3</sub>phenyl]-3-CN-4-[SO-CF<sub>3</sub>]-5-NH<sub>2</sub>pyrazole.

5. Composite material according to one of  
claims 1 to 4, characterized in that the gypsum board  
10 has a thickness of between 0.5 and 5 cm, preferably between 0.6 and 2 cm, and the cardboard or the paper a relative density of between 50 and 500 g/m<sup>2</sup>, preferably between 150 and 250 g/m<sup>2</sup>.

6. Composite material according to one of  
15 claims 1 to 5, characterized in that the thickness of the cardboard or paper sheet or sheets is between 0.1 and 10 mm, preferably between 0.2 and 5 mm.

7. Composite material according to one of  
claims 1 to 6, characterized in that the amount of  
20 compound of formula (I) is an amount which is effective against perforations by insects, in particular by termites.

8. Composite material according to one of  
claims 1 to 7, characterized in that the amount of  
25 compound of formula (I) is between 0.001 and 10 g/m<sup>2</sup>, preferably between 0.01 and 2 g/m<sup>2</sup>.

9. Method for the protection of dwellings against damage caused by insects of perforating type,

characterized in that a composite material according to at least one of claims 1 to 8 is fixed to at least 50%, preferably 95%, of the total surface area of the interior wall of partitions and walls.

5                   10. Method according to claim 9,  
characterized in that the insects of perforating type  
are termites.

11. Dwelling offering improved protection  
against insects of perforating type, characterized in  
10 that at least 50%, preferably 95%, of the total surface  
area of the interior wall of its partitions and walls  
is covered with a composite material according to  
according to at least one of claims 1 to 8.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;  
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**PROTECTION AGAINST TERMITES**

the specification of which (check only one item below):

is attached hereto.  
 was filed as United States application

Number \_\_\_\_\_  
on \_\_\_\_\_  
and was amended  
on \_\_\_\_\_ (if applicable).

was filed as PCT international application

Number PCT/FR97/00816  
on May 7, 1997  
and was amended under PCT Article 19  
on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 (a)-(e) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

**PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. §119:**

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. §119
FRANCE	96/06179	10 May 1996	<u>X</u> Yes <u>     </u> No
			<u>     </u> Yes <u>     </u> No
			<u>     </u> Yes <u>     </u> No
			<u>     </u> Yes <u>     </u> No
			<u>     </u> Yes <u>     </u> No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

(Application Number)

(Filing Date)

(Application Number)

(Filing Date)

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONTINUED)  
(Includes Reference to Provisional and PCT International Applications)ATTORNEY'S DOCKET NO.  
022650-498

I hereby claim the benefit under Title 35, United States Code, §120 of any United States applications(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose to the Office all information known to me to be material to the patentability as defined in Title 37, Code of Federal Regulations §1.56, which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

## PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		STATUS (check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S. APPLICATION NUMBERS ASSIGNED (if any)		

I hereby appoint the following attorneys and agent(s) to prosecute said application and to transact all business in the Patent and Trademark Office connected therewith and to file, prosecute and to transact all business in connection with international applications directed to said invention:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONTINUED) (Excludes Reference to Provisional and PCT International Applications)		ATTORNEY'S DOCKET NO. 022650-498
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